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## WOOLWICH.

(Concluded from No. 445.)

[The Repository and Rotunda, Woolwich.]

FROM the Arsenal a few steps will bring us to the gates of the Royal Dockyard, an establishment to which Woolwich may be said principally to owe its present importance. At an early period the natural capabilities of the place were deemed admirably adapted for the construction of vessels; the river at this part being nearly a mile across, and deep enough to float vessels of the largest burthen within a very short distance of the shore; and accordingly in the reign of Henry VIII. a royal dockyard was established here, in which the well-known "Harry Grace à Dieu" was built in 1515. This magnificent vessel (of which a description will be found in vol. vii., page 136, of this work), after exciting the greatest wonder and admiration on account of its size (being then the largest vessel ever built), and the splendour of its decorations, for a period of about forty years, was at length accidentally consumed by fire in 1553, in the very yard in which it was built.

It was not, however, until the reign of Elizabeth that the Dockyard of Woolwich became of any importance. That wise princess, seeing the value of a well-appointed navy to other nations, resolved to pay more attention to her own; and as the success of a naval expedition depends not only on the talents and enterprise of its commanders, but in a great measure on the build and equipment of the vessels, all that the experience of the seaman and the theory of the mathematician could suggest for the improvement of naval architecture was put to the test in the specimens which emanated from the dockyard at Woolwich.

The superior build of the vessels constructed at this place raised it to considerable importance, and it was from here that most of the ships celebrated in the victories of Drake and Hawkins, and in the voyages of Cavendish and Frobisher, were launched.

In was in the reign of Charles I., after the Dockyard had been greatly enlarged and the interior economy much improved, that the magnificent vessel, "The Sovereign of the Seas," was constructed. She was registered for 1637 tons; measured in length 232 feet, in breadth 48 feet, and in height from the keel to the highest point of the stern 76 feet. After having signalized herself in several actions during nearly sixty years, she was at last destroyed by fire at Chatham, whither she had

proceeded to undergo some repairs, in the year 1696.

Thomas Heywood published a very minute description of this vessel when she was launched, from which all the important parts have been given in the present work (vol. vii., page 340).

The Dockyard increased as the importance of our navy became more apparent to succeeding sovereigns, and at the present time is of very considerable extent. It commences at the village of New Charlton on the west, and extends nearly a mile along the banks of the river to the east, at which part it closely approaches the Arsenal. It contains two large dry docks for the repair of vessels, and an extensive basin, four hundred feet long, and nearly three hundred in breadth, capable of receiving vessels of the largest size. There are also extensive ranges of timber-sheds, storehouses, several mast-houses, a large pond for masts, and others for boats. And as all the iron instruments used in the construction of ships are manufactured at this place, a large building has been erected for the purpose, provided with steam-engines of great power. The anchors, many of immense size, which have been cast and finished here, are disposed in long ranges, ready for instant employment.

Each department is under the superintendence of a separate officer, the whole being under the direction of the Board of Admiralty. A commissioner, the master-attendant, the storekeeper, and the principal officers of the other departments, reside on the spot, several houses having been erected for their accommodation.

Let us now proceed to the Repository and Rotunda, of which a view is given in the preceding page. It is situated on the margin of Woolwich Common, to the south of the town. The ground around the building is much broken, and intersected with two or three pieces of water, which afford the Artillery corps opportunities for the practice of many manœuvres likely to be brought into operation during war. Embankments and fortifications have also been constructed, mounted with the various species of ordnance employed in the defence of besieged places, at which the men are exercised. They are often directed to form pontoons across the ponds, and practised in the methods adopted for the raising of sunken guns, &c.

The Rotunda was originally erected in Carlton Gardens by George IV. when Prince Regent, for the reception of the allied sovereigns on the occasion of their visit to England in 1814, and was subsequently presented by him to the Garrison at Woolwich, where it was removed to become a depository for models connected with military and naval architecture. Its form is a regular polygon of 24 sides, having a diameter of 120 feet, with the roof ascending in the form of a cone to more than fifty feet.

The building, having a tent-like form, was at first wholly unsupported in the centre, but not being considered perfectly secure, a pillar was subsequently erected as a central support.

The interior is crowded with military weapons of offence and defence. In the centre, tastefully arranged around the pillar, are old English weapons, as the antient matchlock, the wheel-lock, two-handed swords, early cannon, shields, bills and partizans, pikes, helmets, cuirasses, &c., together with many trophies from foreign powers. Above these is a beautiful suite of armour, said to have belonged to the chivalrous Bayard.

Near the walls are exhibited many other articles of a similar description, consisting of the arms and costume of the North American Indians, the South Sea Islanders, &c.; rockets of every variety, models of bombs, the larger cannon, howitzers, and mortars, with their different carriages. There are also models of foreign artillery, and a splendid matchlock taken from Tippoo Saib at Seringapatam. Here are also many models of "infernal machines," and several inventions by Sir William Congreve.

In the body of the room are models of forts, cities, and dockyards, including a splendid model of Gibraltar, the Dockyards of Chatham and Portsmouth, the Breakwater at Plymouth, the Isle of St. Kitts, the citadel of Messina, the town and environs of Quebec, showing the spot where Wolfe fell, &c. &c. In the rock of Gibraltar the interior passages and excavations, with the whole of the fortifications, are shown. It would be a long task, and an unprofitable one, to notice all the objects of interest in this museum; but several hours might be advantageously employed in their inspection.

## DEER-STALKING IN THE HIGHLANDS.

A very beautiful and interesting work has just been published upon this subject, by William Scrope, Esq.,* and we avail ourselves of its pages to present to our readers a slight description of the sport, and a few notices of the graceful and spirited creature it concerns: not as we see it in our own green parks, but as it is when wildly roaming through the still wilder Scottish forests, free as the air it breathes, and stepping as proudly along its native crags as though it neither knew nor would acknowledge a master.

Of this most exciting of all British sports we have here a scarcely less exciting account by one who has evidently enjoyed it with all his heart and soul. He luxuriates in the mere remembrance with the gusto of a true lover, whilst his eloquence aims at no higher object than to enable others to participate in his gratifications. Of any of those sports which involve pain or anguish to the animal creation, we profess to be no admirers; but in this there is so much mental skill and physical fortitude required, the scene is so full of inspiring and elevating influences, with its crags, mountains, and precipices, its cataracts, and its burns, its storms, its mists, and its "golden exhalations of the dawn;" there is, in short, so riotous a sense of life, such a delicious feeling of enjoyment obtained in the pursuit, that we in "populous cities pent" cannot at least but unfeignedly envy the deer-stalker the happiness of a day in the Highlands. We proceed to give a specimen of the sport, in which we have done little more than condense the author's description, and have been forced to sacrifice much of the dramatic interest contained in the original.

It is just day-break; the stalker leaps from his bed, takes a single glance at the sky to see the course of the wind, and hurries on his apparel. Breakfast awaits him, a Scotch breakfast, fit preparative for the exertions of the day. Tea and coffee, venison pasty, mutton chops and broiled grouse, eggs, rolls, dry toast, and household bread are set forth in sufficient profusion to satisfy the sharpest as well as the most epicurean appetites. Breakfast over, he is prepared for a start. His attendants, one holding a couple of hounds in a leash tugging with impatience to be off, are quite ready, and they all move on at a good pace through the light falling mist. Ben Dairg (or the red hill) is their immediate object. They ascend its rugged sides with the firm steps of men accustomed to the toil, until they reach the point immediately under the huge mass of granite which forms the summit of the mountain, and where all around are the bones of young fawns, lambs, and moor-fowl, the prey of the fox, the wild cat, and the eagle. A little higher, and they are on the top of Ben Dairg, looking down as upon a new world. Here everything bears the original impress of nature, untouched by the hand of man since its creation. The vast moor spread out below, the mass of huge mountains heaving up their crests around, the peaks in the

* 'The Art of Deer-Stalking,' by William Scrope, Esq., published by Mr. Murray. From this work the matter of our article is borrowed; and where we could, we have quoted the author's own words.

distance, faint almost as the sky itself, give the appearance of an extent boundless and sublime as the ocean. Through all this desolate region there is nothing that can remind you of domestic life; you shall hear no sound but the rushing of the torrent, or the notes of the wild animals, the natural inhabitants; you shall see only the moor-fowl and the plover flying before you from hillock to hillock, or the eagle soaring aloft with his eyes to the sun or his wings wet with mist. The stalker now lays down his rifle on the heather, creeps forward on his hands and knees to a spot where he may have the best view of the glens below, steadily poises his telescope, and takes a minute survey. Disappointed, he is about to turn away and shift his position, when a something attracts his attention in the bog by the burn under an opposite mountain. "It is, yes, it is a hart! a fine noble fellow with a magnificent pair of antlers, as he shows us by that toss of his head." With a rapid yet accurate glance the landmarks all round the spot where the hart lies are noted, one of the party is left to watch his movements, whilst the others endeavour by a circuitous route to get within shot. They descend the hill easily enough; but now must advance on their hands and knees over the surface of the black bog; now they must descend into the rocky burn, following its continual windings, until they reach a piece of green sward, open to the view of the watchful hinds, who are scattered on the surface of the hill above the devoted hart. What is now to be done? A still more circuitous path is sought in vain. "Raise not a foot nor a hand," commands the leader; "let not a hair of your head be seen; imitate my motions precisely." He lies down upon his breast, and worms himself along, half stifled, concealed only by a small ridge that barely covers him and his followers, who with great precision execute the same manœuvre. Again they are stopped; the burn crosses their route, and a deep-looking stream of water glides along its channel. There is no help for it; they descend silently into the pool (not daring the while to lift their heads above the ground), the guns are carefully handed from one to another as they stand immersed breast-high, and thus they again reach the sward; and to the stalker's delight, behold one of the marks previously noted in the neighbourhood of the deer. Is he still there? The stalker raises his head slowly inch by inch; the horns are just visible over the line of the ground. Subduing his delight, he feels his rifle, makes a slight noise, the deer is seen to spring, and the crack of the gun is heard at the same moment—the hart is gone! But not unhurt, the ball is in him, and the dogs are after him. Away they go over moss and rock, steep and level, in and out of the black mire, unto the foot of a hill, which they ascend with a slackened pace. Up the nearest eminence runs one of the hunters, and with levelled glass endeavours to watch their course. The deer-stalker at his topmost speed follows the chace, listening anxiously as he runs for the bark of the dogs significant of their having brought the stag to bay. The wished-for voices soon break upon him, he redoubles his speed, and a sudden opening being entered, there is the magnificent creature, standing on a narrow projecting ledge of rock within the cleft, in the middle course of the mountain cataract, the rocks closed in upon his flanks, bidding defiance in his own mountain-hold! On the very edge of the precipice the dogs are baying at him furiously; one rush of the stag will send them down the chasm into eternity, yet in their fury they seem wholly unconscious of the danger. Delay would now be fatal; the stalker creeps cautiously round to the nearest commanding spot; every moment is precious, yet the least carelessness on his part that should reveal his presence to the deer would cause the latter to break bay, and in all probability precipitate the fate of the dogs. Meantime the stag, maddened by their vexatious attacks, makes a desperate stab at one of them, which the dog, endeavouring to avoid, retreats backward, loses his footing, his hind legs slip over the precipice—he is lost! No, he struggles courageously, his fore feet holding on by the little roughnesses of the bed of the torrent. He rises a little, but slips back again; he gasps painfully, but summons up all his strength and resolution for one last effort; hurra! the gallant dog has recovered his footing, and, not even taking breathing time, rushes at the hart as rash and wrathful as ever! The stalker is now ready on a mount overlooking the scene; he levels, but a sudden movement brings the dogs within the scope of the gun. Three times is the aim taken and abandoned; a fourth—crack! the ball is in the deer's head, he drops heavily into the splashing waters.

Deer, except in embarrassed situations, always run up the wind; their scent thus giving them warning of any concealed enemies in front, and their speed ensuring them against danger from the rear. They prefer lying in the open crevices where the swells of wind come up occasionally from all quarters. There is no animal more shy or solitary by nature than the red deer. He takes the note of alarm from every living thing on the moor—all seem to be his sentinels. He is always most timid when he does not see his adversary, for then he suspects an ambush. If, on the contrary, he has him full in view, he is as cool and circumspect as possible; he then watches him most acutely, endeavours to discover his intention, and takes the best method possible to defeat it. From all this it may be gathered that the qualifications of a deer-stalker are really of a high order. In Mr. Scrope's enumeration of them, there is much simple truth beneath the facetious exaggeration. "Your consummate deer-stalker," he says, "should not only be able to run like an antelope, and breathe like the trade winds, but to run in a stooping position, at a greyhound pace, with his back parallel to the ground, and his face within an inch of it for a mile together. He should take a singular pleasure in threading the seams of a bog, or in gliding down a burn like an eel. Strong and pliant in the ancle he should indubitably be; since in running swiftly down precipices, picturesquely adorned with sharp-edged, angular, vindictive stones, his feet will get into awkward cavities; if his legs are devoid of the faculty of breaking, so much the better. He should rejoice in wading through torrents, and be able to stand firmly on water-worn stones unconscious of the action of the current; or if the waves be too powerful for him, when he loses his balance and goes floating away on his back (for if he has any tact or sense of the picturesque, he will fall backwards), he should raise his rifle aloft in the air, lest his powder get wet. As for sleep, he should be a stranger to it; and if a man gets into the slothful habit of lying in bed for five or six hours at a time, I should be glad to know what he is fit for? Steady, very steady his hand should be, and at times wholly without a pulse. Hyacinthine curls are a very graceful ornament to the head, but I leave it to a deer-stalker's own good sense, whether it would not be infinitely better for him to shave his crown at once than to risk the loss of a single shot during the season. As to mental endowments, he should have the qualifications of a Ulysses and a Philidor combined. Wary and circumspect, never going rashly to work, but surveying all his ground like an experienced general* before he commences operations, patient under suspense and disappointment, fertile in conception, and rapid and decisive in execution. He must be brave to attempt, he must have fortitude to suffer. What more can be required for the greatest undertakings?"

[To be Continued.]

* "It is fact," says Mr. Scrope, "that one of our most gallant and celebrated generals, Lord Lynedoch, declared that he obtained his knowledge of ground by deer-hunting in Atholl Park."

## PROGRESS OF THE ART OF ILLUMINATING MANUSCRIPTS.

[Continued from No. 445.]

[The Duke of Bedford and St. George.—From the Bedford Missal.]

THE illuminations of MSS., as exemplifying the state of painting in the early ages; and the influence which such performances must have had on the formation and improvement of taste in art, have never received that consideration from historians of painting which the importance of the subject would seem to demand. In England, as in France, until after MSS. had been superseded by the introduction of printing, these are almost the only monuments of the art which exist; and in Germany, before the sixteenth century, there were but few artists who exerted themselves in the higher departments of their profession. Therefore, in treating of the early state of painting in those countries, it is absolutely necessary to consult such authorities, if we wish to obtain an accurate view of the subject. But even in Italy, the cherished abode of the arts, where painting was patronized from almost its first introduction with as much ardour as in the periods of its greatest perfection, the art of illuminating MSS. with miniatures was the first and, for a long period, nearly the only style in which painting was practised; and in the times of Giotto, Cimabue, &c. (to which the restoration of art is generally referred), it exhibited a degree of excellence in design, composition, and colour, which the larger productions of that age seldom surpass. But not only were the more extensive efforts of the pencil similar in design to the small miniatures in MSS., but the two practices appear to have been held in like esteem; the painters of one being often the draftsmen of the other, as in the instances of Giotto, Simone Nemmi, Cosima Tura, &c.

If we compare the drawings of manuscripts with the large fresco paintings of the early ages (as, for instance, of the thirteenth century), we shall find the same peculiarities of drawing, the same arrangement of colours, the same disposition of the figures, in fact the same style, disfigured with like defects, existing in both. The excellence of art does not consist in the vehicle employed by

the artist, nor in the size of his picture, but in the management of his subject, the composition or grouping of his figures, the expression of the passions in their countenances and attitudes, &c., which, whether portrayed in oil or in water colours, on the walls of a chapel, the compartments of an altar, or the leaves of a book, equally exhibit the richness of the artist's imagination and his powers of execution. We ought not therefore to refer to Giotto and the other painters in fresco of his time as the restorers of art in Italy, if we find that their contemporaries, or even their predecessors, were equally deserving of praise for their success in developing the grand principles of art, though only such specimens of their talents may exist as the Missals and Choral Books of the Italian monasteries exhibit. It will be found that the progress made by the early Italian painters was gradual, each succeeding period improving upon that which preceded it; and this is observable not only in the frescos of the more celebrated painters, but in the miniatures of the less known though not less talented artists.

The notices of those Italian artists who enriched the MSS. of the twelfth and following centuries are nearly as incomplete as the accounts we have of the illuminists of other countries at like early periods. Vasari has placed Oderigi da Gubbio and Franco Bolognese (of the latter part of the thirteenth century) among the earliest miniature painters; but several other artists who exercised this art have been named by other writers as having flourished previously, and a number of Italian MSS. of the twelfth and eleventh centuries exist, which, although they do not furnish us with the artists' names, serve to exhibit the state of art at the periods at which they were executed, and prove that excellence in this, as in other pursuits, was the result of time and experience.

In the splendid library of Sir T. Phillipps there is a MS., said to have been given by the Countess Matilda to the Benedictine monastery at Mantua, which contains several miniatures executed in the eleventh century, of considerable merit for the time. Ottley has given a slight description of this MS. in his account of the Devonshire Benedictional, in the 'Archæologia.' At a somewhat later period, the commencement of the thirteenth century, Oderico of Sienna flourished, an artist whose name appears attached to some illuminations to a MS. of the date of 1213, in the library of the academy at Florence; his style, however, did not excel that observable in other productions of the time. Another Sienese artist of the same period is mentioned with more applause: this was Guido or Guidone, who is mentioned by Lanzi, from Marmi and other writers, as having employed himself in painting miniatures. No specimen of his smaller compositions is believed to exist; but in the church of St. Dominico, at Sienna, is a picture of the Virgin painted by him in 1221, which has received the encomiums of several writers, and has been declared to be but little inferior to the productions of Cimabue, who afterwards adopted a very similar style.

The illuminatists of this period were extremely numerous, as the many MSS., especially the books used for chanting the services of the Romish church, called Choral Books, executed for the Italian monasteries, and particularly for the Papal library, amply testify.

In Italy, as in England and France, many of the miniatures which adorn early MSS. were the production of the monks, who, secluded in the cloister, sought some amusement in this elegant employment; and from the monasteries of Italy have sprung some of its most esteemed painters.

It was in the latter part of the thirteenth century that Oderigi da Gubbio and Franco Bolognese were employed to enrich the MSS. of the Italians, especially those of the Papal library. Both are mentioned by Dante in his 'Purgatorio,' in a manner which shows in what estimation they were held by the Italians; the passage in which this notice occurs, is also valuable for the evidence it affords of the renown of the French illuminators.

"'O,' dissi lui, 'non se' tu Oderisi,
L' onor d' Agubbio, e l'onor di quell' arte
Che alluminar è chiamata a Parisi?'
'Frate,' diss' egli, 'più ridon le carte
Che pennellegia Franco Bolognese:
L' onor è tutto or suo, e mio in parte.'"*

PURGATORIO.—Canto XI.

Oderigi died about 1300, and Franco Bolognese (who studied under him) in about twenty years after.

To this period may be referred the productions of Simone, one of which, in the Ambrosian library at Milan, has received particular commendation. This is a MS. of Virgil with the Commentary of Servius, once the property of Petrarch. In the frontispiece is a miniature, to which the following verses are subjoined:—

"Mantua Virgilium qui talia carmina finxit,
Sena tulit Simonem digito qui talia pinxit."

The artist has represented Virgil sitting in the attitude of writing, "with his eyes raised to heaven, inviting the favour of the Muses. Æneas is before him in the garb and with the demeanour of a warrior, and, pointing with his sword, intimates the subject of the 'Æneid.' The 'Bucolics' are represented by a shepherd, and the 'Georgics' by a husbandman; both of whom are on a lower foreground of the piece, and appear listening to the strain. Servius, in the meantime, appears drawing aside a veil of great delicacy and transparency, to intimate that his readings unveil what would otherwise have remained obscure and doubtful to the reader of that divine poet." The composition and colouring of these illuminations have been praised by Bianconi, in an account of this MS., in P. della Valle's 'Sienese Letters;' but he says, some of the characteristic peculiarities of the early painters, especially in the heads and hands, are observable. This artist was born in 1284, and died in 1345.

In the early part of the fifteenth century, two artists greatly distinguished themselves as painters, both in miniature and fresco.

F. Giovanni da Fiesole, or B. Giov. Angelico, as he is sometimes called, was born in 1387, and as a Dominican friar, employed himself in ornamenting books with miniatures, an art he learned from an elder brother, who executed miniature and other paintings. "His works discover some traces of the manner of Giotto, in the posture of the figures and the compensation for deficiencies in the art, not to mention the drapery, which is often folded in long tube-like forms, and the exquisite diligence in minute particulars common to miniature painters."† We are not aware that any of his miniature productions are now in existence, but in Florence and Pisa there are many of his larger works in fresco, which exhibit great power of imagination, facility in drawing, and acquaintance with colours.

The other artist to whom we have alluded was a monk named Filippo Lippi, who imitated the preceding painters, and whose larger works may be seen at Naples, at Padua, and at Spoleto, &c.

[The wood-cut in page 108 is from a miniature in a magnificent 'Book of Offices,' written and ornamented for John, duke of Bedford, in the reign of Henry VI. We have not left ourselves room for a description of this MS. in the present number; but we shall more particularly allude to it in our next article.]

[To be continued.]

* "'O!' I exclaimed,
Art thou not Oderigi, art not thou
Agobbio's glory, glory of that art
Which they of Paris call the limner's skill?'
'Brother!' said he, 'with tints that gayer smile,
Bolognian Franco's pencil lines the leaves.
His all the honour now; mine borrow'd light.'"

CARY'S *Translation.*

† Lanzi.

## THE HISTORY OF A TEA-CUP.—No. II.

However numerous may be the varieties of pottery, from the elegant china vase, or the delicate biscuit statue, down to the common red flower-pot, flint and clay form the two staple articles of which they are formed. In proportion to the fineness of the ware sought to be produced, must be the care bestowed upon the choice and preparation of the materials, and the addition of other substances to the two essential ones which we have mentioned. We shall therefore proceed to describe successively the materials employed; the mode of preparing them; of making the prepared materials into the desired form; and of baking, glazing, ornamenting, and gilding the tea-cup or other article produced.

Silica, or pure flint, occurs in most parts of the world in primitive mountains; nodules, or large pebbles, are also found embedded in chalk; and in a still more pulverized state, it is presented to us in the form of gravel in alluvial districts. The shingle which abounds so greatly at the sea-coast near Brighton and other seaports consists of silica, or flint. The best flints are of a dark grey colour approaching to black: those pieces which present yellow patches are rejected by the potter, on account of their containing iron as one of their ingredients. The rolled pieces of flint taken from chalk-pits are those most useful to the potter: the larger specimens of these are dark within, and covered externally with a white crust.

Clay is, generally speaking, well known to everybody; indeed its soft and remarkably inelastic character has furnished us with the words "clayey," "claylike," &c., in reference to substances having those properties. Clay, when absolutely firm, does not emit any odour; but in the form in which it is always found, and used in manufactures, it emits a peculiar odour when breathed on. One source of the great value of clay to the potter is, that it can be mixed with water in any proportion, so as to afford a liquid as clear as milk; or a mixture of the consistence of cream,—of butter,—or of putty, as may be required. Another property, and perhaps the most valuable to the potter, is its power of bearing the most intense heat of a furnace without the smallest approach to liquefaction. By the process of heating or baking, it assumes a colour varying from red to pure white, depending principally on the amount of iron which it contains;—that species containing the most iron becomes red by baking.

The principal part of the potters' clay used for the better kinds of ware in England is a stiff clay, blue, black, or brown, brought from Devonshire and Dorsetshire, and from thence conveyed to Staffordshire. Mr. Wedgwood, in giving evidence before the House of Lords in favour of abolishing certain restrictions to commerce, spoke of the potteries as being not only advantageous to Staffordshire itself, but as enriching a vast number of persons by the preparation and conveyance of clay, &c. from the West of England to the Pottery district. He alluded to "the great number of persons employed in raising and preparing the raw materials in several distant parts of England, from near the Land's End in Cornwall, —one way along different parts of the coast, to Falmouth, Teignmouth, Exeter, Poole, Gravesend, and the Norfolk coast; the other way to Bideford, Wales, and the Irish coast. The coasting vessels, which have been employed at the proper season in the Newfoundland fishery, carry these materials coastwise to Liverpool and Hull, to the amount of more than twenty thousand tons yearly; and at times when, without this employment, they would be laid up idle in harbour. Besides this, is the further conveyance of these materials from those ports, by river and canal navigation, to the Potteries, situated in one of the most inland parts of the kingdom."

Of the different kinds of West of England clay, the blue variety brought from the Isle of Purbeck is most valuable to the potter, and commands the highest price. Each kind has its peculiar excellences, and the potter employs one or more of them according to the description of ware which he wishes to produce. Supposing the proper kind of clay to be ready at hand, the potter begins his labours as follows.

The clay has to be mixed with water; but as this could not be effected in the mass, the clay is cut up into smaller pieces. This is sometimes effected by means of a long wooden instrument with a blade at one end, by which the clay is cut up,—an office requiring great manual labour. In large establishments it is effected by a machine. The clay is put into a cylinder, through the middle of which runs a shaft, having knives projecting, like radii, from it. The shaft is made to revolve, and the knives inserted in it cut the clay up into small pieces. The clay is then mixed with very pure water in a vessel, by a kind of churning process,—the quantity of water being so regulated that the whole shall assume the consistence of cream. This cream is then passed successively through sieves of different degrees of fineness, so as to separate it into portions fit for different kinds of pottery. The water with which the clay is to be mixed is selected with much care, since the presence of mineral substances might materially injure the porcelain. In France it is customary to use only rain-water; and in Germany, it is said, that the potter mixes his clay only twice a year,—in spring and autumn,—from some supposed peculiarity in the rain at those seasons.

Having now spoken of the preparation of the clay, we proceed to that of the flint. The proper kind of flint being procured, they are burned or calcined in a kiln, and then plunged, while red hot, into cold water, by which they are rendered more easily broken. The flints are then broken into small pieces, either by hand, or by being placed upon a strong iron grating, and struck with hammers moved by machinery. The small pieces thus produced are mixed with a little water, and ground to powder between two stones,—in a way somewhat similar to that in which corn is ground. The millstones employed in this process are exceedingly hard, in order to prevent particles from being worn off them and mixed with the flint. Some years ago some potters experienced a heavy loss, by purchasing flints which had been ground between stones which contained carbonate of lime: the carbonate became mixed with the flint and deteriorated it. The water employed in grinding both facilitates the process and protects the workmen from the injurious effects which used to result from inhaling the small particles of flint which floated in the air during the dry grinding.

The flints are next briskly agitated in water, by which they become mixed with it; the larger particles soon subside, and the water containing the smaller particles is poured into another vessel, when, by another subsidence, the smaller particles of flint are obtained in a form fit for use.

The small quantities of other ingredients,—whether nitre, or lead, or old broken pottery (each manufacturer having a favourite formula of his own), are now prepared and brought to such form as to fit them for being mixed with the two leading ingredients.

The flint and clay are now ready to be mixed together. Each is mixed with water to the consistence of cream; and before the two are united, it is arranged that they shall have that particular degree of fluidity, that a pint of the flint cream shall weigh thirty-two ounces, and a pint of the clay cream twenty-four ounces:—these weights having been found best in practice. The clay, the flint, and the other ingredients (which are however very small in quantity), are then well mixed up together, so as to form a very smooth and uniform body. In this state the mixture is called *slip*, and is boiled for a certain time in a long brick trough called a *slip-kiln*; this is forty or fifty feet long, and about four or five wide, and has a fire underneath. During the boiling, the mixture is kept con-

stantly stirred, and by the constant evaporation the slip becomes much stiffer or thicker.

The mixture, which is now in the state of a soft clay, is beaten and kneaded with wooden mallets, so as to make it as uniform and as smooth as possible. To increase this effect, and to expel every semblance of an air-bubble, it undergoes the process of *slapping*. The mass is cut through with a piece of wire (similar to the mode in which a barrel of butter is cut into slices), and the pieces are hurled down upon one another with the utmost strength of a powerful workman. This is repeated until the mass of clay becomes perfectly homogeneous,—equally stiff in every part,—uniformly smooth, and free from air-bubbles. This last precaution is of much importance, since a single air-bubble would spoil the tea-cup or other article made from that piece of clay: the heat of the furnace in which the cup is placed, after being formed, would expand the air and fracture the cup. It may well be conceived that the process of *slapping* is a laborious one; for the workman is continually lifting and hurling masses of clay of fifty or sixty pounds weight. In some establishments this is performed by machinery.

The mixed clay has now undergone all the processes necessary to prepare it for the manufacture of pottery; and it is *thrown*, *pressed*, or *cast*, according to the nature of the vessel to be produced. These three processes we will consider in succession.

Tea-cups, saucers, basins, and similar articles of a circular form, are mostly made by that process which is called *throwing*. A man stands in front of the "potter's wheel." This consists of a flat table, above and parallel to which is a circular stand connected with a pillar or axle, which passes down through the table. The pillar is connected with some revolving machinery,—either by means of a band or web passing round the pillar, and also round a wheel, which is turned by a boy, or else worked by a steam-engine which sets many such wheels in work at once. When the vertical pillar is made, by either of these means, to revolve, the stand revolves with it, not being in connection with the table. A girl stands near the man who works at the table, and who is called the *thrower:* her office is to cut pieces off a large lump of clay, regulating the size according to the nature of the vessel to be produced. Each piece she kneads well between her hands, and then passes it on the "thrower."

The thrower now throws the lump of clay with some force down on the revolving stand, and works it up into a conical form between his hands,—presses it down again,—and repeats these processes two or three times, so as to expel the least semblance of an air-bubble from the substance of the clay. He then brings the clay into a circular form by the action of his hands,—the stand, and the clay which is upon it, being put into rapid rotation,—and proceeds with his fingers and thumbs to fashion the cup,—giving the clay a circular form,—making a depression in the centre to form the inside of the cup,—and giving a rough under bending to the exterior, to form the general contour of the vessel. In doing this, some of his fingers are on the inside and others on the outside of the vessel; and he is assisted from time to time by tools called *ribs* or *profiles*, which are variously shaped, and with which he fashions, scrapes, and smooths the various parts of the cup as it rotates. All this is done with amazing rapidity; and to facilitate the process, when a number of vessels similar to one another are to be made, pegs are fixed to the outside of the revolving stand, which serve as a guage or guide, by which the requisite size of the vessels can be more readily obtained. When completed, each vessel is cut off the board with a thin piece of wire, and laid aside to dry. In this state the vessel, whether a tea-cup or in any other form, resembles a common basin in the circumstance that it is without spout or handles: these appendages we shall have to speak of hereafter.

If it were a plate, a saucer, a flat dish, or any similar shallow vessel, instead of a cup, which is being made, the shape is not procured by *throwing*, but by *pressing*. A model of the proper size and shape is prepared, and from this a plaster of Paris mould is made, a process nearly analogous to that described in "Plaster Figures and Casts." ('Penny Magazine,' No. 419.) This mould is placed upon the revolving stand,—sprinkled with powdered porcelain sifted through a fine cloth,—and covered with a flat cake of clay, of such a size as experience has told the workman is fitted for the purpose. The clay he then presses on with his hand until a tolerably equable and smooth layer covers the mould in every part. This produces the outer surface of the plate, and the inner surface is regulated, formed, and smoothed by profiles adapted to the purpose. If a ledge or foot of any kind is required, it is placed on afterwards in the same manner as handles and spouts,—to be described. The superfluous parts of the plate are cut away, and the surface finished with a horn tool and a damp sponge.

When the tea-cup or other vessel, whether procured by throwing or pressing, has lain by a sufficient time to acquire that particular degree of dryness which the workmen call the "green" state, it is taken to the "turning lathe," where its form and surface are much improved. The vessel is fitted to a lathe which sufficiently resembles that of a common wood-turner, to render a particular description unnecessary. The workman then proceeds to "turn" it;—that is,—irregularities are pared off,—equability of thickness is produced,—circular rings, ridges, and depressions are produced round the outside, as a species of ornament,—and a general smoothness of surface is attained. He employs tools of different sizes, from a quarter of an inch to two inches broad, and about six inches long; they are made of iron,—the cutting end being turned up about a quarter of an inch, and ground to an edge. Sometimes the edge is indented with scollops, or is *milled* like the edge of a shilling: this is produced by a peculiar lateral motion of the lathe while the turner is working at it.

We must reserve the *handle* of our tea-cup to the next paper.

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## SWORD-DANCING IN NORTHUMBERLAND.

[From a Correspondent.]

THERE is a curious and ancient game or custom prevalent among the coal-miners of Northumberland and Durham, which, as it is peculiar to those counties, and, perhaps, little known beyond them, it may be interesting to describe. In the places where this Game is practised, it is called "sword-dancing," from the circumstance of the performers having each an instrument resembling a sword in appearance, but more elastic, with which they contrive to exhibit many curious feats and figures whilst they are dancing.

With the northern coal-miners, sword-dancing is a Christmas game. It is not however practised by them for mere amusement altogether, but partly with the view of making a little money. For this purpose, these sword-dancers, during the Christmas holidays, make excursions among the neighbouring towns and villages in companies of from twenty to thirty in number, where they exhibit their dancing skill. Besides the dancers, there are always two other individuals connected with them, called respectively the *Bessy* and the *Fool;* the former of whom is dressed in petticoats, and in other respects disguised as an old woman; and the latter in the most grotesque costume that can possibly be imagined,—composed, usually, of the skins of animals. Each of those two personages is provided with an iron or tin box, with which, accompanied with a number of odd gestures, they solicit donations from the by-standers, whilst their brethren are dancing. There is also another person attached to

those strolling companies of sword-dancers in the capacity of Fiddler. A peculiarity in the dress of the dancers remains to be noticed. Their hats, and the sleeves and breasts of their jackets, are profusely decorated with cockades, made of ribbons of the gayest hues, which give them a picturesque appearance.

Formerly, sword-dancing was a very popular amusement among the coal-miners of Northumberland and Durham, during the festive season of Christmas, but it is now but very partially practised by them; and, like many other of their pastimes, is gradually giving place to more rational pursuits.

## CAUSES OF WHIRLWINDS, MOVING PILLARS OF SAND, AND WATERSPOUTS.

[From an article "On the Electricity of the Atmosphere," in the 'Companion to the British Almanac' for 1839.]

To the principle of electricity we refer a class of remarkable phenomena not usually ranked together—whirlwinds, pillars of sand, and waterspouts—the appearance of which being very well known from frequent description, we shall at once proceed to consider their nature. In the explanations generally given it is assumed that there are currents of air blowing in different directions, the oblique meeting of which causes an eddy or vortex, having a vacuum in its interior. Against this hypothesis it may be objected that, in the greater number of instances recorded, the air has been either calm or with a wind moderate and steady without any cross currents. If these meteors had a mechanical origin of this kind, they ought to abound most where variable winds and storms prevail, as on sea-coasts, near headlands, and among hills. On the contrary, they are most rare in such cases, rather affecting climates and seasons of hot still atmosphere, in desert plains or tropical seas. Besides, in order to form a vortex, it is necessary that a coherent body be present to deflect the current into the tangential motion producing the whirl. A vortex cannot be formed in the free atmosphere whatever be the respective velocities or angle of meeting of currents, and, according to all experience, a shift of wind is preceded by a calm, lasting until one of the currents has obtained predominance. That waterspouts and whirlwinds are independent of motion in the air is made evident by their having often a rapid progression although the air around them be still, and by their having been seen even to advance against a wind then blowing; and when several waterspouts have been in sight at once, some have been stationary, others running about without any common direction.

In assigning these phenomena to the agency of electricity, there are no conditions assumed the existence of which can be disproved; and it cannot be denied that the cause is adequate to the effect attributed to it. We may distinguish two kinds of them, according as the electricity has accumulated in the earth, and discharges itself into the air, or, as the electricity is emitted from a charged cloud, exercising a powerful induction upon the surface of the earth beneath, but without exploding. In the former case, which is peculiar to land, the resulting action constitutes the whirlwind or the pillar of sand, the different appearance of which is owing to the nature of the soil from which they rise. Whirlwinds are of most frequent occurrence in those countries not free from earthquakes and dry hot seasons during a limited time of the year, such as the wide valley of the Mississippi. Compared with the pillars of sand they are more terrible in their destructive energies, but they are more casual, and are generally single. Pillars of sand are confined to the deserts of Africa and Hindostan; they are individually less dangerous, but they are not to be despised if it be true that each of them may deposit a quantity of suffocating dust, forming a hillock of greater height than a man, and that countless numbers may be stalking across the arid plain with inevitable speed.

The electricity, which we believe to be the prime mover of these extraordinary spectacles, may possibly have different sources, and, we are inclined to suspect, a less superficial excitation of that in the whirlwind. But however the charge may be derived, when it has accumulated to such intensity that the electrical inertia of the air is unable to repress it, it will rush upwards in a stream, communicating an ascending motion to the air, and bearing along with it whatever light mobile particles may be within its influence.

If there were in the superincumbent atmosphere a sufficient mass to supply by induction the requisite quantity of the opposite electricity, then the accumulation might have been discharged in the ordinary manner by explosion. In the absence of this the electricity, taking the direction in which it meets with least resistance, tends to dissipate itself in a stream through the air so long as it can force a passage. The stream expands in its progress by its own elasticity, so that its diameter is greater as it recedes from the earth, often describing very exactly an inverted cone. While the stream continues the opposite kind of electricity is induced into the air along its path, and flows downwards towards the point of emission, or apex of the cone, where the primary charge is most concentrated. Now, it has been proved by experiment, that every electric current contains within itself a revolving action, the consequence of the attraction of the opposite electric surfaces. To this property of an electric we may therefore assign the origin of the spiral motion of the whirlwind, conceiving that it results from the longitudinal or ascending motion of the stream, influenced by the circular or revolving motion of the two electricities round each other. The velocity of the spiral motion is too great to be followed by the eye, and its mechanical effects, exhibited in the lifting of loaded waggons, the levelling of stone-walls, the cutting through fences, trees, and huts, as if with an edged tool, are ascribable to no other physical cause than electro-dynamic.

Waterspouts have the same principles of action, but in them the accumulation exists in a low heavy cloud, which has induced the opposite electricity into the earth beneath, without finding a prominent point to facilitate an explosion. The charge is gradually neutralised by combination with that rushing in a stream from below, and carrying with it dust from the plain, and vapour, or rather a mist from waters. The watery particles being again aggregated into drops, sometimes as large as cherries, descend in torrents, and a circulation is thus established while the accumulation exists.

The spouts or tubes, apparently let down from the cloud, are formed by the vapour or mist attracted by the electricity which has elongated itself into a protrusion by an effort to discharge itself.

*Study of the Fine Arts in Italy.*—These hills (the Alban) abound in as pretty bits of the picturesque as a painter's eye need look upon. Indeed, independently of the works of art with which this country overflows, the splendid light, the depth and richness of tint, the clearness with which the outline of objects is traced, and the accuracy with which the eye at a glance can define their relative distance—all resulting from the singular transparency of the atmosphere—combine to make Italy the true volume for an artist to study. Of a truth, nature executes her light and shade with exquisite skill. Here is no obscurity, no faintness, no mist, no haziness, no mingling, confounding, or blending together of objects; everything stands out decidedly and boldly, and in its own individual character, distinct in outline, in form, colour, and position. Then, if the painter wishes to rise a step in the dignity of the subject he chooses for his pencil, and, instead of the inanimate works of nature, transfer to his canvas living specimens thereof, here are faces, of the women especially, faultless in the estimation of criticism. I never saw in any country so many pretty women, so many finely formed heads, intelligent countenances, expressive eyes, sunny complexions. Truly nature has done a great deal for them. . . . Much has been said about Italian beauty. It is a theme on which the pen of poets, the brush of painters, and the chisel of the sculptor have rejoiced to dwell. And verily it is a subject capable of furnishing no scanty materials to all the three. Yet the style of beauty is very different from that on which we are in the habit of founding our notions in England. Here is no fair complexion, no ruddy hue, no blended union of the rose and lily, which form a great part of the northern ideas of beauty. That life and animation which, in England, are in general the result of health, and without which there can be nothing like beauty, are here produced by expressiveness of countenance and intelligence of the eye. What is written on the *cheek*, in the North—is inscribed on the *eye* in Italy.—*Scraps from an Unpublished Journal written in Italy.*

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